Source Water Assessment and Protection
Executive Summary

People who live in or visit the state of Wyoming enjoy pristine natural resources. One of the most important of these resources is water. The Wyoming legislature passed the Environmental Quality Act in order to protect its valuable water resources in 1973. This act directed the Wyoming Department of Environmental Quality (DEQ) to preserve the waters of the state and to prevent, reduce, and eliminate water pollution. Both surface and groundwater sources must be protected by either remediation activities or preventative measures. To this end, the state of Wyoming is currently developing a program that will protect both surface and groundwater drinking water supplies.

In 1996, the United States Congress passed legislation requiring the development of Source Water Assessment and Protection Programs. Sections 1453 and 1428(b) of the Safe Drinking Water Act Amendments require all states having "primacy" to develop a Source Water Assessment and Protection Program. States which have primacy have the responsibility for administering the federal rules and regulations of the Safe Drinking Water Act. Although Wyoming is the only state that has elected not to take primacy, the value and benefit of the Source Water Assessment and Protection Program was recognized. During the 1998 legislative session, the Wyoming Legislature authorized DEQ to set aside 10%, or $1.2 million, of the 1997 federal Drinking Water State Revolving Fund monies to develop a Source Water Assessment and Protection Program and complete Source Water Assessments.

Similar to the Wellhead Protection Program which preceded it, the United States Congress intended the Source Water Assessment and Protection Program to compliment the more traditional drinking water quality programs. Unlike the Wellhead Protection Program, however, Source Water Assessment and Protection applies to drinking water supplies using any combination of surface water and groundwater.

The Source Water Assessment and Protection Program was intended to encourage the development and implementation of drinking water protection programs on a local level. Information collected during the source water assessments can be used by local governments, public water systems, and citizens to develop plans to safeguard their water supplies. In order to be effective at the local level, the public must be able to understand, participate in, and benefit from the program. Public participation was therefore encouraged in all stages of Wyoming's Source Water Assessment and Protection Program development.

As required by the 1996 Safe Drinking Water Act Amendments, each state must write a Source Water Assessment and Protection document. These documents will be reviewed and approved by the United States Environmental Protection Agency (EPA). The EPA published some general guidelines to assist the states with the development of their Source Water Assessment and Protection programs. Per these guidelines, each state program must indicate how the public was involved in the design process, how the source water assessments will be done, and how the assessment results will be communicated to the public.

Due to Wyoming's unique primacy status, the completion of source water assessments for all public water systems is not mandatory. Instead, Source Water Assessment and Protection is a voluntary program. Public water systems that choose to participate will be ranked by factors such as water supply type, population served, and past compliance history. Public water systems that use surface water, have poor compliance histories, or serve large populations will be the highest priority systems. High priority systems will be assessed first, ensuring the completion of source water assessments for systems with the greatest need for source water protection.

Each source water assessment will involve four steps. The first step is to determine the area which contributes water to the well or intake. The second step will be to inventory potential sources of contamination within this area that could affect the water supply. The third step is to complete an analysis of the susceptibility of the well or intake to contamination from these sources. The fourth step will be to publish a report summarizing the findings of the assessment. All four steps need to be completed by June of 2004.

Source Water Area Delineation

The first step in completing a source water assessment is to delineate, or determine, the source water area. The source water area is the area which contributes water to the well or intake. In surface water systems, the source water area will be the entire watershed upstream from the intake. In cases where water is diverted from one watershed to another to augment a public water system's supply, the source water area will include all watersheds which contribute water to the intake. In groundwater systems, a distance from the wellhead equivalent to a five year time of travel will be determined. Time of travel boundaries can be determined by using the calculated fixed radius method, analytical models, or hydrogeological mapping. The method used will depend on the type of aquifer and the water flow pattern. Some wells or intakes use a combination of groundwater and surface water. In these situations, the source water area will be determined using both groundwater and surface water delineation techniques.

Contaminant Inventory

The second step in conducting a source water assessment is to complete an inventory of potential sources of contamination within the source water area. Potential sources of contamination are contaminant sources that have the potential to impact the quality of the water supply. One of two types of contaminant inventory will be conducted based on proximity to the wellhead or intake.

The most detailed type of inventory, called a comprehensive inventory, will be conducted in the areas closest to the wellhead or intake. A comprehensive inventory will include a database search as well as a local inventory efforts. State and federal regulatory databases contain information on

permitted facilities, land uses, and other activities that could affect the water supply. Information about other potential sources of contamination, such as historic landfill or gas station sites and septic systems is not readily available in state or federal databases. These potential sources of contamination are best identified on the local level. Comprehensive inventories will be conducted within the two year time of travel boundary for wells. For surface water intakes, a comprehensive inventory will be done within a 1000 foot zone on either side of all perennial streams tributary to the intake for a distance of 15 valley miles upstream from the intake. Alternatively, a distance upstream from the intake equivalent to an eight hour time of travel can be used if this information is available.

A less detailed, limited contaminant inventory will be conducted in the areas farthest from the wellhead or surface water intake. Limited contaminant inventories will include only a state and federal database search to identify the most serious potential sources of contamination. Limited inventories will be conducted in the portions of the source water area not listed above.

Susceptibility Analysis

The third step in the source water assessments is to complete a susceptibility analysis. The potential for each of the contaminant sources identified in the inventory step to impact the water supply will be analyzed. Several factors will be examined when determining the susceptibility of the water supply to contamination. The first is the integrity of the well or intake structure. Well constructed and maintained wells and intakes reduce the ability of contaminants to enter the water supply. The second is the sensitivity of the area over or through which contaminants must move to reach the well or intake. Physical, geologic, and hydrologic factors will be evaluated to determine how easily contaminants can move through the aquifer or watershed. The nature of the contaminant involved is the third factor which determines susceptibility. The type of contaminant, the proximity of the contaminant source to the well or intake, and whether or not a contaminant release has been confirmed will be considered. These factors will be combined in a series of matrices to determine the susceptibility of the water supply to each contaminant source.

A summary of the susceptibility of a well or intake to all contaminants and contaminant sources will be produced. This summary will allow a public water system to identify the most serious threats to the water supply. Susceptibility summaries will also include a discussion of how the contaminant sources may affect the water supply. Potential management options for controlling contaminant sources or improving the water treatment capabilities may also be discussed.

Source Water Assessment Reports

The fourth and final step in completing a source water assessment is the preparation of a source water assessment report. This report will summarize all the information collected during the assessment. Each report will include a map illustrating the source water area and the locations of potential sources of contamination in relation to the well or intake. A summary of well or intake susceptibility will be presented in a combination of tables and narratives.

The availability of these source water assessment reports will be publicized. As source water assessment reports are completed, the DEQ will publish a notice of availability in its quarterly newsletter. DEQ will also encourage public water systems to send out notices in monthly billings or newsletters or post notices in conspicuous locations. Community water systems will also include

a brief summary of assessment findings and a notice of how to obtain a copy of the report in their annual Consumer Confidence Reports.

Copies of the assessment reports will be kept in locations convenient to the public. For example, one copy will be given to the public water system. Other copies of the assessment report will be kept at the DEQ state office and DEQ district offices. Assessment reports will also be available over the Internet.

Source Water Protection Plans

DEQ will encourage public water systems that have participated in source water assessments to develop Source Water Protection plans. The key to preventing contamination of Wyoming's public drinking water supplies is to develop protection plans. DEQ considers the development of Source Water Protection plans to be the ultimate goal of the Source Water Assessment and Protection Program. The protection of drinking water resources will play an important part in Wyoming's future.

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